UHLERSTOWN BRIDGE
Spanning Delaware Canal, Uhlerstown Hill Road
Uhlerstown
Bucks County
Pennsylvania

HAER PA-588
PA-588

PHOTOGRAPHS

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WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD
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HISTORIC AMERICAN ENGINEERING RECORD

UHLERSTOWN BRIDGE

HAER No. PA-588

LOCATION:	Spanning Delaware Canal, Uhlerstown Hill Road, Tinicum Township, Bucks County, Pennsylvania UTM: 18.493792.4486075, Frenchtown, PA Quad
STRUCTURAL TYPE:	Wooden covered bridge, Town lattice truss
DATE OF CONSTRUCTION:	1856, reconstructed 1985
BUILDER:	Mahlon C. Lear (1820-1889), Erwinna, PA
PRESENT OWNER:	Bucks County
PREVIOUS USE:	Vehicular bridge
PRESENT USE:	Vehicular bridge
SIGNIFICANCE:	The Uhlerstown Bridge was the only covered bridge to span the 60-mile Delaware Division Canal. Although the wood floor system has been replaced with steel, the structure otherwise retains its historic integrity and has been well-maintained by the county engineers and local citizens. It is an excellent example of the local bridge building traditions, which relied heavily on the Town lattice truss.
HISTORIAN:	Researched and written by Sarah Maria Rose Dangelas, summer 2002
PROJECT INFORMATION:	The National Covered Bridges Recording Project is part of the Historic American Engineering Record (HAER), a long-range program to document historically significant engineering and industrial works in the United States. HAER is part of the Historic American Buildings Survey/Historic American Engineering Record, a division of the National Park Service, U.S. Department of the Interior. The Federal Highway Administration funded the project.

Chronology

1738	The township of Tinicum, in Bucks County, is established.[1]
1827-1834	The Delaware Division of the Pennsylvania Canal is constructed and opened.
1844	The wooden, covered, six-span Alexandria Delaware Bridge over the Delaware River from Frenchtown, NJ to Uhlerstown, PA opens to traffic.
	Citizens of Tinicum Township petition for a public road between the Delaware River at the Frenchtown Bridge and the Delaware Canal at Lock No. 18 (Uhlerstown Hill Road).
1854	Citizens of Tinicum Township petition for a new bridge over the Delaware Canal at Lock 18 (Uhlerstown).
June 1856	Lear finishes construction of the Uhlerstown Bridge.
1931	A steel truss bridge replaces the wooden covered Alexandria Delaware Bridge.
	The Delaware Canal closes; 40 miles of it are deeded to the state as conservancy land.
1940	The entire 60 miles of the Delaware Division Canal become a state park.
1978	The Delaware Canal State Park is named a National Historic Landmark.
1985	The Uhlerstown Bridge is reconstructed using original materials. Steel multi-girder support replaces the wooden flooring.
1994	Uhlerstown Bridge is listed on the National Register of the Historic Places as a contributing resource of the Uhlerstown Historic District.

[1] Davis, *The History of Bucks County, Pennsylvania.*

Introduction and Significance

The Uhlerstown Bridge spans 102' across the Delaware Division (see HAER No. PA-103) of the Pennsylvania Canal. It crosses the canal just downstream from Lock Number 18, in Uhlerstown, Tinicum Township, Bucks County, Pennsylvania.[2] The bridge carries Uhlerstown Hill Road, which connects the road along the western bank of the Delaware River to the hills along the west bank of the canal. The Uhlerstown Bridge is significant for its association with the 60 mile long Delaware Division Canal. This was the only covered bridge to span the canal. Although the wood flooring has been reinforced with steel, the structure otherwise preserves its historic integrity and has been well-maintained by the county engineers and local citizens. It is an excellent example of the local bridge building tradition, which relied heavily on the Town lattice truss.

Description

The Uhlerstown Bridge is a single span Town lattice truss. The bridge is about 102' long. The portal opening is 14'-9" wide. The vertical clearance is 11'-3". The east entrance has a long approach with wing walls along the road narrowing to the single lane bridge deck (see Appendix A, Illustration 1). The west entrance butts up against a T-intersection. The public road continues to the right. The wing walls along this approach are perpendicular to the bridge truss.

All of the masonry is mortared, cut stone, reinforced in places with concrete (see Appendix A, Illustrations 1, 3, and 4). Concrete slabs cap the wing walls. The walls connect to the abutments but do not otherwise touch the bridge. A red colored sandstone is the primary rock used in the abutments and wing walls. The abutments' mortar has been reinforced or replaced with concrete in some places and is covered with moss in other places. The east abutment rests on a higher level than the west abutment. This is due to the mule towing path, which runs parallel to the canal. Beneath the bridge, a cut stone retaining wall supports the tow path (see Appendix A, Illustration 3). The truss sits on top of the abutment.

Canal water is diverted into a small mill stream for the grist mill that once stood just south of the bridge on the west bank. It rejoins the canal water under the bridge. The remains of the canal lock are about 200' upstream from the bridge. There is a lock tender's house on the west bank at the lock.

The lattice truss is three diamonds high (see Appendix A, Illustrations 2 and 5). It contains about twenty-seven lattice planks in each direction, on each side, spaced about 3' apart.[3] The seven connections along each plank are pinned with two 1 ½" diameter wooden treenails (8-9" long and tapered). Some of these look newer.

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[2] Almost all previous sources call this Lock No. 8, but it appears from the sources cited here that it is an error.
[3] The extreme ends of the truss are not visible since they are behind a shelter panel.

In the few instances where the brace is not a single plank, the members are connected with a lap joint and bolted through the uprights. The bolt is submerged into the wood so that it is flush with the plank's surface in four instances (see Appendix A, Illustration 6). All had a relatively new bottom section, and all were at the center of the bridge--two on either--giving the lattice planks new timber to meet the lower chords. The chords on the top and bottom sandwich the lattice web.

The lower secondary chord is composed of two 3 x 12" planks joined with wooden treenails to make a 6 x 12" chord. The lower primary chord has three planks; the outermost appears to be a nailer for the sheathing and the innermost is new, perhaps working with the steel floor system. The bridge deck rises almost to the top of the lower secondary chord. The stringers are steel. The transverse floor beams are 2 x 6" laid flat side to flat side. The deck is made of 3 x 12" planks nailed to transverses. Along the edges of the bridge, bolted down to the deck, are hub rails 9" high. Photographs indicate that these were put on sometime between 1983 and 1989.

The primary and secondary upper chord members are each composed of two 3 x 12" planks joined with wooden treenails to make a 6" deep by 12" high chord. The bottom of the lower top chord is about 8" from the top of the upper bottom chord. There are 19" between the two members of the top chord. The lattice planks are cut flush with the top of the upper top chord.

Transverse overhead beams are barely notched into the top chord. Diagonal braces form X's (one sitting on top of the other) meeting the transverse beams before they rest on the truss. They are joined there with mortise and tenon and some have an adjustable wooden wedge. There are eight overhead panels across the bridge and one empty panel at the east portal.

The upper lateral braces that meet the west portal are notched where they cross and are of a different wood. The first and second panels in the overhead bracing show damage from oversized vehicles. On the east side of each transverse beam, a sway brace crosses the beam and is joined to it with a wooden treenail. The top of the knee meets the rafters at an acute angle, and the bottom is bolted to the lower top chord (see Appendix A, Illustration 2). Those nearer the ends of the bridge are notched to meet both the lower upper chord and the diagonal truss brace below the chord. The sway braces are 5 x 5" and some older, rusted large nails indicate that these may be original or at least very old.

There is one window on either side of the bridge at the center. The opening begins at deck level and rises 3 ½'. Each is about 14' wide and has a shallow awning and a 12" plank across the bottom for a sill. These are not convenient for viewing the canal, but probably help oncoming traffic see if another car is crossing. There are guardrails in front of each window, but these do not continue the length of the truss. They are nailed to the lattice planks.

One spacer runs longitudinally, mid-way between the chords on the outside of the truss. This helps the chords carry the housing. The sheathing is of 1 x 12" planks set vertically and painted

brick red.[4] The portal faces are also of vertical planks, painted white on the sides of the portal and brick red at the tympanum. The east portal has a name plaque. There is no overhang at the gable ends, but there are shelter panels composed of vertical sheathing inside the portals (see Appendix A, Illustration 2). These cover the first 8' to 8 3/4' of the truss at both ends and are painted white. A guard rail is nailed to these panels.[5]

The roof is of wood shingles. The eaves extend only about 1' from the siding, and there is a very small window at that point that runs the length of the bridge to let in light.

The truss is made of oak, a locally available wood.[6] Other bridges in the area were of local hemlock, oak, or pine. The abutments are of a red sandstone that is native to the area, most likely quarried locally. Occasionally, other types of rock appear. The mortar has been reinforced over the years with cement.

In 1985, steel girders replaced the original timber floor system of the bridge (see Appendix A, Illustration 3). The beams are painted brown to camouflage them. The bottom chords are connected by eight equally spaced rods, running transversely, from the outside of one chord to the outside of the other. The rods are adjustable at their centers.

The bridge is part of the Delaware Canal system, which is now a 60 mile long recreational park. A small interpretive panel has been erected on the west bank of the canal, alongside a large Department of Conservation and Natural Resources sign.

Covered Bridges in Pennsylvania

With about 225 examples, Pennsylvania boasts more extant covered bridges than any other state or foreign country. At one point, historians speculate, the state had 1,500 covered bridges. Pennsylvania can also claim the first proper covered wooden bridge in the United States; the Permanent Bridge in Philadelphia was built over the Schuykill River by well-known bridge designer Timothy Palmer in 1805.[7]

The state's earliest bridges were primarily stone arch bridges. In the mid-nineteenth century, however, several important patent designs and examples had proven the strength and resourcefulness of covered wooden trusses. Timber bridges quickly became more popular since they were less expensive to construct, called for materials that were easy to come by, could span greater widths, and required skills that local builders and carpenters already had. These bridges were covered with roofs and siding to protect the wooden truss members and joints from the

[4] The bridge was left unpainted at least until 1952, when only two bridges in the county were painted (one white and one red). *Panorama 10*, no. 10 (1952).
[5] Photographic evidence indicates that the guardrails were added between 1983 and 1989.
[6] That the truss is oak is generally agreed upon in all of the reviewed sources.
[7] For an account of this bridge, see Richard Sanders Allen, *Covered Bridges of the Northeast* (Brattleboro, VT: Stephen Greene Press, 1957), 13.

elements, thereby considerably increasing their life spans. The height of the covered wooden bridge era was the 1870s and 1880s.[8] Pennsylvanians have been worthy stewards of their covered bridges, as evidenced by the number that have survived to the twenty-first century.

History of the Bridge Site

The Delaware Division of the Pennsylvania Canal was determined fit for navigation in 1834.[9] It allowed canal boats to carry freight, primarily coal, and occasionally passengers, the 60 miles from Easton south to Bristol. There were twenty-three locks along the canal and a mule towing path along the eastern bank.

One of the locks, Number 18, was situated on the Erwinna Flats on land deemed to be "almost valueless."[10] A lock house was built on the west bank of the canal at this time. Between the house and the canal, the pass water was diverted from the canal just upstream of the lock and converged again with the canal a few hundred feet downstream. On the narrow strip of land between the two waterways, a tool shed was built.[11] These were the only structures at this site for some time. In the fall of 1844, the road, today known as Uhlerstown Hill Road, was laid out.[12] Local residents had petitioned for this road to link the public road (Rover Road) near the Frenchtown Delaware Bridge to the canal tow path at Lock No. 18.[13] Soon after, a bridge may have been constructed to connect this road to the one that runs along the west bank of the canal.[14]

The crossing to Frenchtown, the establishment of good public roads, the canal, and the location of the lock combined to make this area more desirable to local entrepreneurs. By the end of the 1850s, a town had developed from the river to the lock and beyond. Uhlerstown, as it is called today, is a flat area of agricultural land nestled between the Delaware River to the east and steep palisades to the west rising above the canal. The village developed along both banks of the canal.

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[8] In the 1840s, after Howe and Pratt patented their designs, builders began in earnest to incorporate more and more metal in their covered wooden bridges.

[9] B.F. Fackenthal Jr., "Improving Navigation on the Delaware River with some Account of its Ferries, Bridges, Canals and Floods," *Bucks County Historical Society, Papers* V. 6 (1932): 202.

[10] This was the report from the surveyor of the public property to be affected by the canal. Board of Canal Commissioners, "Reports and Miscellaneous Documents for the Delaware Division Canal 1827-1858," (Harrisburg: Collection of the Pennsylvania State Archives, RG 17), Microfilm 3433.

[11] See the 1834 drawing and description of this tract in the papers of the Board of Canal Commissioners, "Instructions to Engineers Volume 3, page 154," (Harrisburg: Collection of the Pennsylvania State Archives, RG 17), Microfilm 3433, 1085.

[12] Papers for the construction of this road were filed as #1446. The papers are archived on microfilm at the Clerk of Courts Office in the Bucks County Courthouse and at the Bucks County Historical Society Library. See also the Commissioners' Road Book #6, pages 104, 409.

[13] The reviewer reporting on the proposed location notes that the road will end "on the bank of the toe [sic] path near Lock No. 18." The "toe path" is on the east bank of the canal. Road Papers 1446.

[14] No reference as to what this bridge might have been, or whether an alternative crossing, such as a ford, preceded it could be found.

In 1905, county historian W.W.H. Davis said that: "Uhlertown, opposite Frenchtown, is an enterprising place, and large quantities of hay, grain and straw were formerly shipped on the canal from there, also a successful business carried on in building and repairing boats and lime-burning. A new grist mill was erected, 1877. It has a brick school-house, and during the winter, a literary society is a feature of its social life."[15] By all accounts, the town owed its success to Michael Uhler (1822-1896) and Levi Ruth. Both settled around Lock 18, which was then referred to as Mexico, in 1853. Within a few years, they each owned several buildings and businesses there. Uhler ran a store, a gristmill, lime kilns, and most famously, a canal boat building yard. He became a postmaster in 1871, and the town became known alternately as Uhlertown, Uhlerville, and Uhlerstown.[16] Ruth bought much of the property between the canal and the River Road, on both sides of Uhlerstown Hill Road. He ran a hotel along River Road and also farmed. He sold parcels of his land in small areas to newcomers.[17] In 1854, Ruth and Uhler joined several other local men in petitioning for a better crossing over the canal.

Construction of the Bridge[18]

A county bridge in southeastern Pennsylvania in the nineteenth century typically began with a petition from local citizens interested in having a bridge constructed. This was presented before the Court of Quarter Sessions and had to be approved first by appointed viewers, meant to be impartial, and then by the court and grand jury. If the courts agreed to the expenditure, the local newspapers printed a notice soliciting bids for the bridge's construction. The county commissioners reviewed the bids and awarded one bidder--usually, but not always, the lowest--the contract. Upon completion, the commissioners were notified and they then petitioned the court to appoint another team of viewers to inspect the bridge. If all was according to contract, the court was obliged to disburse the balance due on the contract price.[19]

At the 1854 April Session of the Court of Quarter Sessions in Doylestown, Bucks County, fifteen citizens of Tinicum Township submitted a petition that stated:

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[15] W.W.H. Davis, *The History of Bucks County, Pennsylvania*, 2nd. ed. (New York: Lewis Publishing Co., 1905).
[16] J.H. Battle, ed., *History of Bucks County* (Philadelphia: A. Warner & Co., 1887), 1139-40.
[17] Jeffrey L. Marshall, "Uhlerstown Historic District National Register Form," (Washington, DC: National Park Service, 1992), section 8, pages 1-2.
[18] The plaque over the east portal of the bridge dates to its construction in 1832. This date has gone unchallenged in nearly all of the secondary sources. However, none of these sources mentions evidence to support the date. The author believes that the date 1832 was assumed as it was the opening of the canal. Several factors work against this. First, there was no public road for the bridge to carry until Erwin Kennedy and others proposed one in 1844. Also, none of the extant drawings, written descriptions, petitions, etc. for this road mentions an existing bridge at the canal end of the proposed road. Second, there was no residential or commercial development in this location until the early 1850s. There is a lack of primary materials from 1832 regarding a bridge. The Bucks County Clerk of Courts *Bridge Book ca. 1775-1893* dates the bridge at 1855 (p. 138). All of the primary documents and contemporary newspapers consulted corroborate the later date of 1856.
[19] For a more detailed description of this process, see Fred J. Moll, *Covered Bridges of Berks County, Pennsylvania* (Reading, PA: Reading Eagle Press, 2001).

> that the bridge across the Delaware Division Pennsylvania Canal at the foot of the Lock at Erwinna where a public road crosses the canal from the Alexandria Delaware Bridge[20] through the said township of Tinicum is in a delapse [sic] state and is not located upon the proper scite[21] [sic] and that the public labr [sic] under much inconvenience for the want of a new bridge which expense would be greater than the township could bear.[22]

The commissioners then appointed six viewers to assess the need and location for such a bridge. These men returned to the commissioners at the September Sessions and reported that they agreed that a bridge was needed "to connect immediately with the center of the road running from the river road, near the Alexandria Delaware Bridge to the canal and crossing the canal to connect with the road leading to another public road near George Ruth's dwelling and that the said bridge will in the erection thereof be more expensive than would be reasonable the said Township of Tinicum should bear."[23] The Grand Jury approved the construction on September 13, and the commissioners concurred on November 2, 1854. Generally a call for proposals would be issued in the local papers for a number of weeks following this approval. In this case, the advertisement was not issued until December 1855 when the *Doylestown Democrat* printed the following notice:[24]

> PROPOSALS--For building a KING POST BRIDGE over the Canal and Feeder at the locks opposite Frenchtown, will be received on Tuesday the 11th of December, 1855, at the Commissioners Office in Doylestown.
>
> The contractor to find all the materials (except the Stone, which will be delivered on the ground) and to do all the digging and filling and complete the Bridge.
>
> The abutments and pier to be put up and the wood work raised by the 10th of March, 1856.
>
> The length of the abutments and pier is to be 22 feet in thickness, 6 feet in height, of one abutment and pier 8 feet above the tow-path, and the other abutment 6 feet 6 inches above the tow-path; 2 of the wing walls to be 30 feet long each, and 4 feet thick at abutments and 3 feet at the jambs, and the other 2 wing walls 15 feet each, and 3 feet 6 inches at the abutment; and 2 feet 6 inches at the jambs; the guard walls [parapets] to be 20 feet thick and 3 feet high from filling to brackets; the roof to be single pitch, of good white pine clear of sap, jointed and put on in short lengths; the walls to be well pointed.
>
> The length of the wood work over the Canal will be 62 feet the width 18 feet in the clear, and of sufficient height for strength and guard. The timber for the

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[20] The center of Erwinna today lies between Lock 18 and Lock 17 of the canal. However, Lock 18 is the location directly enroute from the Alexandria Delaware Bridge (as known as the Frenchtown Delaware Bridge).
[21] This is most likely a reference to a short span across the lock itself, where the foot bridge is today. This is several yards upstream where the 1844 road meets the canal.
[22] Bucks County Commissioners, *Bridge Book B* (Doylestown, PA: Bucks County Clerk of Courts Office), 38.
[23] Bucks County Commissioners, *Bridge Book B*, 42.
[24] "Proposal," *Doylestown Democrat*, 4 December 1855, 1.

stringers, girders, sills, posts, &c., to be 10 inches by 12 inches, and 12 joice [sic, joists?], 6 inches by 8 inches broad, and supported in the usual way; the plank [presumably floor planks] to be 18 feet long and 2½ inches thick.

The length of the wood work over the feeder will be 26 feet [specifications continue]…of good, sound white oak, and the framework to be well secured with the necessary irons, such as bolts, &c.

J. Cozens
J. G. Webster
November 20, 1855 Paul H. Hartzel

A few weeks later, *Doylestown Democrat* noted in its "Local Affairs" section, that "the Commissioners of this county have awarded the contract for building a bridge over the canal in Tinicum township, to Mahlonn C. Lear, Esq. The bid was $999."[25]

The following summer, another local paper, the *Bucks County Intelligencer*, reported that the county commissioners had appointed six men "to inspect the bridge recently built by Mahlon C. Lear, in Tinicum."[26] At the April Sessions, petitioners had asked the court to recall their contract with "Mahlon C. Lear for the erection of a Bridge over the Delaware division of the Penna. Cnal and feeder at Erwinna." They then noted that the "bridge is now completed," and they requested that viewers inspect it.[27] In June, the viewers found the bridge to be "completed in a substantial & workmanlike manner, according to contract entered into with the commissioners."[28]

Somewhere between the intitial call for bids and final payments on the bridge, the commissioners likely changed their minds about the design.[29] The resulting structure was not a multiple Kingpost truss, but a Town lattice truss and cost the county more than double the contract price. While Lear's bid as published in the newspaper was $999, the contract signed with Lear was for $1,600, according to the petition of the commissioners in April 1856. In February 1857, the county posted its annual financial report in the paper. For 1856, it reported, the county had paid $2,236.75 for a "new bridge at Erwinna, in Tinicum."[30]

Mahlon C. Lear

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[25] "Bridge Contract," *Doylestown Democrat*, 25 December 1855, 3.
[26] "Local Affairs," *Bucks County Intelligencer*, 17 June 1856.
[27] Bucks County Commissioners, *Bridge Book B, Road* and *Bridge Books* (Doylestown, PA: Collection of the Bucks County Clerk of Courts Office), 84.
[28] Bucks County Commissioners, *Bridge Book B, Road* and *Bridge Books*, 86.
[29] The papers regarding the bridge, including the petition and contract, would be part of Bridge Papers, File # 265 ½, but the author was not able to locate these files or microfilmed copies of them. These papers might clear up the mystery. According to covered bridge historian Joseph Conwill, "Most of the Delaware Canal bridges, as found in the mid-twentieth century, were non-housed queenpost trusses. Most of these have been replaced with steel beam bridges with a decorative queenpost side rail which is not functional."
[30] "Bucks County Finances for the Year 1856," *Bucks County Intelligencer*, 17 February 1857, 4.

Mahlon C. Lear (1820-1889) was an active citizen of Tinicum township.[31] In 1871 the county directory lists him as a farmer, then in 1876 as architect, builder and farmer. In 1887, a profile of Lear appeared in Battle's *History of Bucks County*. At that time, his primary career was listed as manager of a fire insurance company. However, Battle's biography notes Lear's several other careers. "He followed carpentering fifteen years, and for fifteen years was a merchant at Erwinna. He then farmed four years, when he re-engaged in carpentering and contracting." He was also on the building committee of the Christ Lutheran Church in Tinicum, which was built in 1862, where he served as decon, sexton, and elder there for many years. Additionally, he was the secretary of the school board and served as school director for twenty-five years.[32]

Mahlon's father Joseph was a carpenter by trade, as were his younger brothers, Isaac and Amos, who are listed as "builders and carpenters" in the 1860 county directory. The Lear family had lived in Erwinna many generations. Davis' county history reports that the "Lears of Tinicum are descended from ancestry who immigrated from Germany to Virginia at an early day. From there Joseph Lear, the grandfather of Mahlon C. Lear, came to Bucks county and settled in Tinicum, near Erwinna, where he died 30 years ago, at the age of 92."[33] Mahlon married Mary Ann (1827-1899) in 1846. They had ten children who continued to live in Tinicum township.

In addition to the interests noted above, Mahlon Lear was clearly interested in bridges. He served as director of the Alexandria Delaware Bridge Company for seven years.[34] The Alexandria Delaware Bridge, built 1844, was a six-span wooden covered bridge.[35] In 1854, Lear bid for a contract to construct another bridge in the Erwinna area. According to the local newspaper, he was not awarded the contract.[36]

Bridge Design

The Town lattice truss was the favored design in Bucks County. All twelve covered bridges extant today in this county are of the Town lattice truss type.[37] Conclusive evidence as to why was difficult to find. Covered bridge historian Richard Sanders Allen proposed that a bias

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[31] He is buried in Lower Tinicum New Cemetery, Row 4.
[32] J.H. Battle, ed, *History of Bucks County* (Philadelphia: A. Warner & Co., 1887), 1133.
[33] W.W.H. Davis, *The History of Bucks County, Pennsylvania*, 2nd ed. (New York: Lewis Publishing Co., 1905).
[34] His father was director when the bridge was constructed in 1844. This is the Frenchtown Bridge over the Delaware River. Battle, *History of Bucks County*, 1133.
[35] B.F. Backenthal Jr., "Improving Navigation on the Delaware River with Some Account of its Feeries, Bridges, Canals and Floods," *Bucks County Historical Society, Papers* V. 6 (1932): 175. A steel truss replaced this bridge in 1931.
[36] His bid was $1,799. The contract went to the lowest bidder, Newberry Williams at $1,040. This was probably the bridge over Swamp Creek in Erwinna, recorded in the December Sessions, 1854. See "Bridge Letting," *Doylestown Democrat*, 11 July 1854, 3.
[37] One history of the area claims that there were two types of trusses in Bucks County--- "the sprung arch and the crisscross or lattice," of which the latter was "evidently the common type, particularly in the northern end of the county" (George M. Hart, "Covered Highway Bridges in Bucks County," *Bucks County Historical Society Papers* V. 7 (1937): 398.) Also, earlier bridges were not typically of the Town design. For example, Lewis Wernwag built a six span bridge across the Delaware River from New Hope, PA to Lambertville, NJ in 1814.

toward Town's design stemmed from Amos Campbell's use of that truss for his bridges over the Delaware River early in the century.[38]

Unlike other parts of Pennsylvania or other regions of the country, Bucks County was not home to specialized bridge builders.[39] Rather, as was true with the Uhlerstown Bridge, contracts were let to local men, who probably had experience with timber framing for houses and barns. The men biddng alongside Lear for the area's bridge contracts were also local farmers, merchants, and builders. The Town truss may have appealed to these builders for its strength and ease of fabrication. Another historian suggests that the "simplicity" of the design appealed to the local craftsmen and commissioners responsible for building of the bridges.[40] In fact, others have noted the relative ease of construction for this truss design. Allen notes that "there was a crying need for a substantial bridge that could be erected by a common carpenter's gang," and the Town truss supplied this.[41] A bridge restorer in Vermont commented thus on the Town truss: "The main thing about the plank lattice was that it was the cheapest and easiest to build. Any carpenter would be able to build it quickly."[42]

Perhaps the commissioners of Bucks County had been persuaded at some time by agents working for Ithiel Town (1784-1844), inventor of the Town lattice truss. Town's truss design had been used prominently on the nearby Delaware, Schuykill, and Conestoga Rivers.[43] Town came from Connecticut, and is one of the premier truss inventors in the United States. He studied at Asher Benjamin's architecture school and established a successful architectural practice with A.J. Davis in New York.[44] He patented his first lattice truss design in 1820 and a revised one in 1835. While he did build a few bridges, more often, Town sold the rights of his patents to others. Royalties earned him $1 per foot of his truss used.[45] He apparently made a good living in this venture.

The importance of Town's design was its general efficacy. Bridge historian J.G. James notes that "one result of the massive bridge-building programme was an increase in the price of large timber and many engineers looked to Town's lattice as a cheap solution."[46] While the Uhlerstown Bridge came at the beginning, not the height of the bridge boom, there may have been other reasons to look toward the small planks and lower costs. The Town truss was a strong one that could be built off-site to the needed length. It "used smaller dimension lumber

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[38] Richard Sanders Allen, *Covered Bridges of the Middle Atlantic States* (Brattleboro, VT: Stephen Greene Press, 1959), 56-57.
[39] For example, Elias McMellan in Lancaster County, built a number of bridges in Pennsylvania. In Indiana, various bridge building companies existed throughout the height of the timber bridge era.
[40] E. Ron Watson, "Bucks County's Covered Bridges," *Bucks County Town and Country Living* 1993, 53.
[41] Allen, *Covered Bridges of the Northeast*, 15.
[42] Gilbert Newbury in Joseph C. Nelson, *Spanning Time: Vermont's Covered Bridges* (Shelburne, VT: New England Press, 1997), 250.
[43] J.G. James, "The Evolution of Wooden Bridge Trusses to 1850 (Continued)," *Journal of the Institute of Wood Science* 9, No. 52 (1982): 175.
[44] Henry F. Withey and Elsie Rathburn Withey, *Biographical Dictionary of American Architects (Deceased)* (Detroit: Omnigraphics, 1970), 604; James, "The Evolution of Wooden Bridge Trusses," 172.
[45] Allen, *Covered Bridges of the Northeast*, 15.
[46] James, "The Evolution of Wooden Bridge Trusses," 175.

than other trusses, required a limited amount of framing and hardware, could easily be built by unskilled laborers, and could span distances up to 200 feet."[47]

The Uhlerstown Bridge, like most of the Town lattice trusses known today, uses the modifications of Town's second patent (1835), which adds a secondary set of chords at both top and bottom to further counter stress of the bridge.[48] Although the primary (upper top and lower bottom) chords bear more stress than do the secondary (lower top and upper bottom), the four sets of chords work together to hold up the bridge. Sandwiched in between the chord members is a series of crisscrossed diagonal braces that further stabilize the truss by transmitting forces between the chords, thus preventing them from shearing, or slipping across each other under stress.

Subsequent History of the Bridge

Near the end of the nineteenth century, county historian W.W.H. Davis noted that, "The Delaware Division Canal, which runs along the [Delaware] river front of the township [of Tinicum], gives the inhabitants great facilities for transporting heavy goods to market, and in importing lime and coal."[49] In 1931, the Delaware Canal closed. Without the canal traffic, commercial activity in Uhlerstown began to fade.

Today, the area can boast that it has retained a nineteenth century environment, as few buildings were built at this location in the twentieth century. This preservation of a large part of the cultural landscape helped the town earn its listing on the National Register of Historic Places in 1994 as an historic district. The Uhlerstown Bridge was included as a contributing resource for this district. On the National Register nomination form, the statement of signficance for the town boasts that it "represents the finest canal related collection of buildings in the country."[50]

The entire Delaware Canal became a state park in 1940 and is now a National Historic Landmark. The entire 60 miles of the canal, tow path, and several supporting resources are managed by Pennsylvania's Department of Conservation and Natural Resources.[51]

The bridge was completely reconstructed using original fabric in 1985. Locals familiar with the reconstruction recall that each timber was disassembled and repaired or cleaned and then re-assembled using the original wooden treenails and timbers wherever possible.[52] There appear to

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[47] Benjamin D. Evans and June R. Evans, *Pennsylvania's Covered Bridges, A Complete Guide* (Pittsburgh: University of Pittsburgh Press, 1993).
[48] This second patent had two major additions: the secondary chords and two layers of lattice work, set off-center from each other but coupled together.
[49] Davis, *The History of Bucks County, Pennsylvania.*
[50] Jeffrey L. Marshall, National Register of Historic Places Inventory Form: Uhlerstown Historic District, 1992.
[51] The Delaware Canal State park website is: http://www.dcnr.state.pa.us/stateparks/parks/d-canal.htm. The visitors' center is in Upper Black Eddy, PA.
[52] Communication with the author by Bucks County engineer Jay McQuade, July 17, 2002.

be very few replacement timbers in the truss sides. A steel multiple-girder system replaced the wooden flooring.

Appendix A, Illustrations

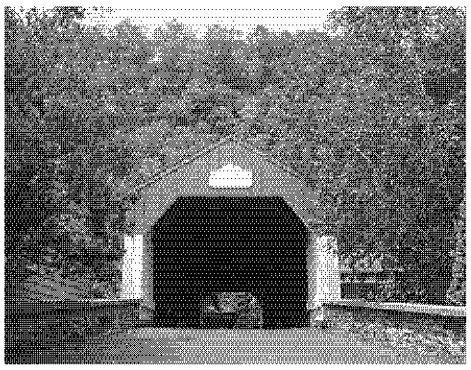

Illustration # 1 East portal. Field photograph courtesy of author.

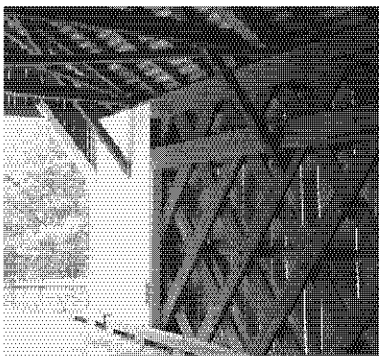

Illustration # 2 South truss. Field photograph courtesy of author.

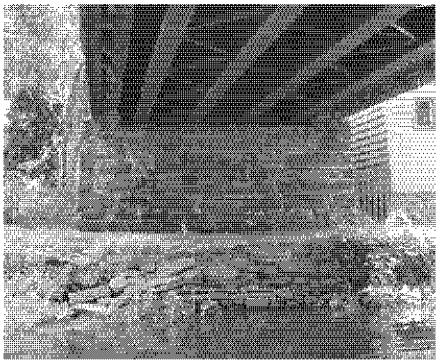

Illustration # 3 East abutment. Field photograph courtesy of author.

Illustration # 4 West abutment. Field photograph courtesy of author.

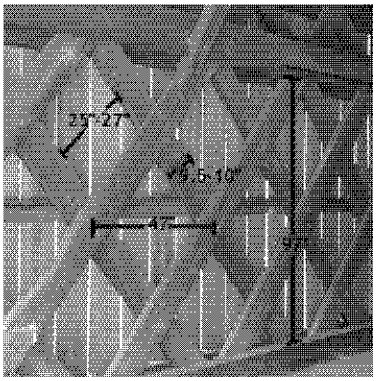

Illustration # 5 Truss dimensions. Field photograph courtesy of author.

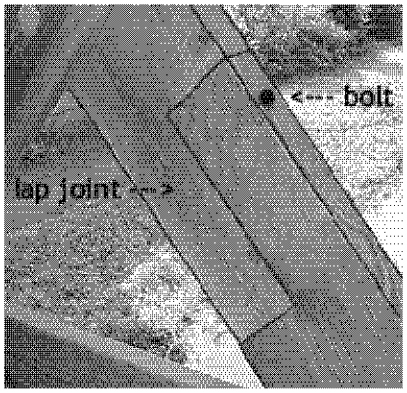

Illustration # 6 Plank members. Field photograph courtesy of author.

Bibliography

Aeppli, Andrew S. and Thomas A. Dormer. "Inspection Report, 09-7009-0443-0203," 2000-2001 Bridge Inspection Program: Bucks County, Bridge No. 203. Philadelphia: Pennoni Associates, 2001.

Allen, Richard Sanders. *Covered Bridges of the Northeast*. Brattleboro, VT: Stephen Greene Press, 1957.

_____. *Covered Bridges of the Middle Atlantic States*. Brattleboro, VT: Stephen Greene Press, 1959.

Battle, J.H., ed. *History of Bucks County*. Philadelphia: A.Warner & Co., 1887.

"Bridge Contract." *Doylestown Democrat*, 25 December 1855, 3.

Bucks County Clerk of Courts. *Bridge Book A*, ca. 1775-1893.

Bucks County Commissioners. *Bridge Book B*. Doylestown, PA: Bucks County Clerk of Courts Office.

Bucks County Historical Society (Spruance Library) collections.

(Bucks County) *Panorama 10*, no. 10 (1952).

Davis, W.W.H. *The History of Bucks County, Pennsylvania.* Second edition. New York: Lewis Publishing Co., 1905.

Evans, Benjamin D. and June R. Evans. *Pennsylvania's Covered Bridges, A Complete Guide.* Pittsburgh: University of Pittsburgh Press, 1993.

Fackenthal, Jr., B.F. "Improving Navigation on the Delaware River with Some Account of Its Ferries, Bridges, Canals and Floods." *Bucks County Historical Society Papers* V. 6 (1932), 103-129.

Hart, George M. "Covered Highway Bridges in Bucks County." *Bucks County Historical Society Papers* V. 7 (1937), 398+.

James, J.G. "The Evolution of Wooden Bridge Trusses to 1850." *Journal of the Institute of Wood Science* 9, no. 51 (1982).

_____. "The Evolution of Wooden Bridge Trusses to 1850 (Continued)." *Journal of the Institute of Wood Science* 9, no. 52 (1982): 169-193.

Lorenz, W. "Map of the canals and railroads for transporting anthracite coal from the several coal fields to the City of New York." Baltimore: J. Dutton Steele, 1856.

Marshall, Jeffery L. National Register Nomination, Uhlerstown Historic District, 1992.

McNair, Thomas S. "Map of the Delaware Division Canal," 1868.

Pennsylvania Department of Conservation and Natural Resources, Delaware Canal State Park. www.dcnr.state.pa.us/stateparks/parks/d-canal.htm.

"Proposal," *Doylestown Democrat*, 4 December 1855, 1.

Schuldenrein, Joseph and Beverly Bastian. "Delaware Division of the Pennsylvania Canal." HAER No. PA-103. Historic American Engineering Record, National Park Service, U.S. Department of the Interior, 1982.

Uhlerstown Historical Society collections.

Waston, E. Ron. "Bucks County Covered Bridges." *Bucks County Town and Country Living* (1993), 46-53, 92.

Withey, Henry F. and Elsie Rathburn Withey. *Biographical Dictionary of American Architects (Deceased)*. Detroit: Omnigraphics, 1970.

Yoder, C.P. ("Bill"). *Delaware Canal Journal*. Bethlehem, PA: Canal Press, 1972.